

TWO NEW *MICROSTIGMUS* SPECIES (HYMENOPTERA, SPHECIDAE),  
WITH THE DESCRIPTION OF THEIR PARASITE,  
*GONIOZUS MICROSTIGMI* sp. n. (HYMENOPTERA, BETHYLIDAE)

GABRIEL AUGUSTO R. DE MELO AND HOWARD E. EVANS

(GARM) Departamento de Biologia Geral, Universidade Federal de Viçosa, 36570 Viçosa MG, Brazil; (HEE) Department of Entomology, Colorado State University, Fort Collins, Colorado, 80523, U.S.A.

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*Abstract.*—Two new *Microstigmus* species are described from Brazil, *M. xylicola* Melo, sp. n. and *M. similis* Melo, sp. n., that nidify within abandoned beetle burrows in wood beams. This biology is atypical because most species of *Microstigmus* construct pendulous nests of particulate material aggregated with silk. These new species prey on nymphs of thrips and are parasitized by a bethylid, *Goniozus microstigmi* Evans, sp. n.

*Key Words:* *Microstigmus*, Sphecidae, *Goniozus*, Bethylidae, new species

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The genus *Microstigmus* is restricted to the Neotropical region and contains 17 described species (Richards 1972). However, the number of undescribed species considerably exceeds that number (West-Eberhard 1977, Melo, in prep.). All species whose nests are known construct pendulous nests built with particulate material aggregated with silk produced by females (Matthews 1968, Richards 1972, West-Eberhard 1977).

The present paper describes two new *Microstigmus* species with very unusual nesting habits for the genus. It also describes their bethylid parasite. In the *Microstigmus* descriptions, microsculptural terms follow Harris (1979).

*Microstigmus xylicola* Melo,

NEW SPECIES

(Figs. 1–7)

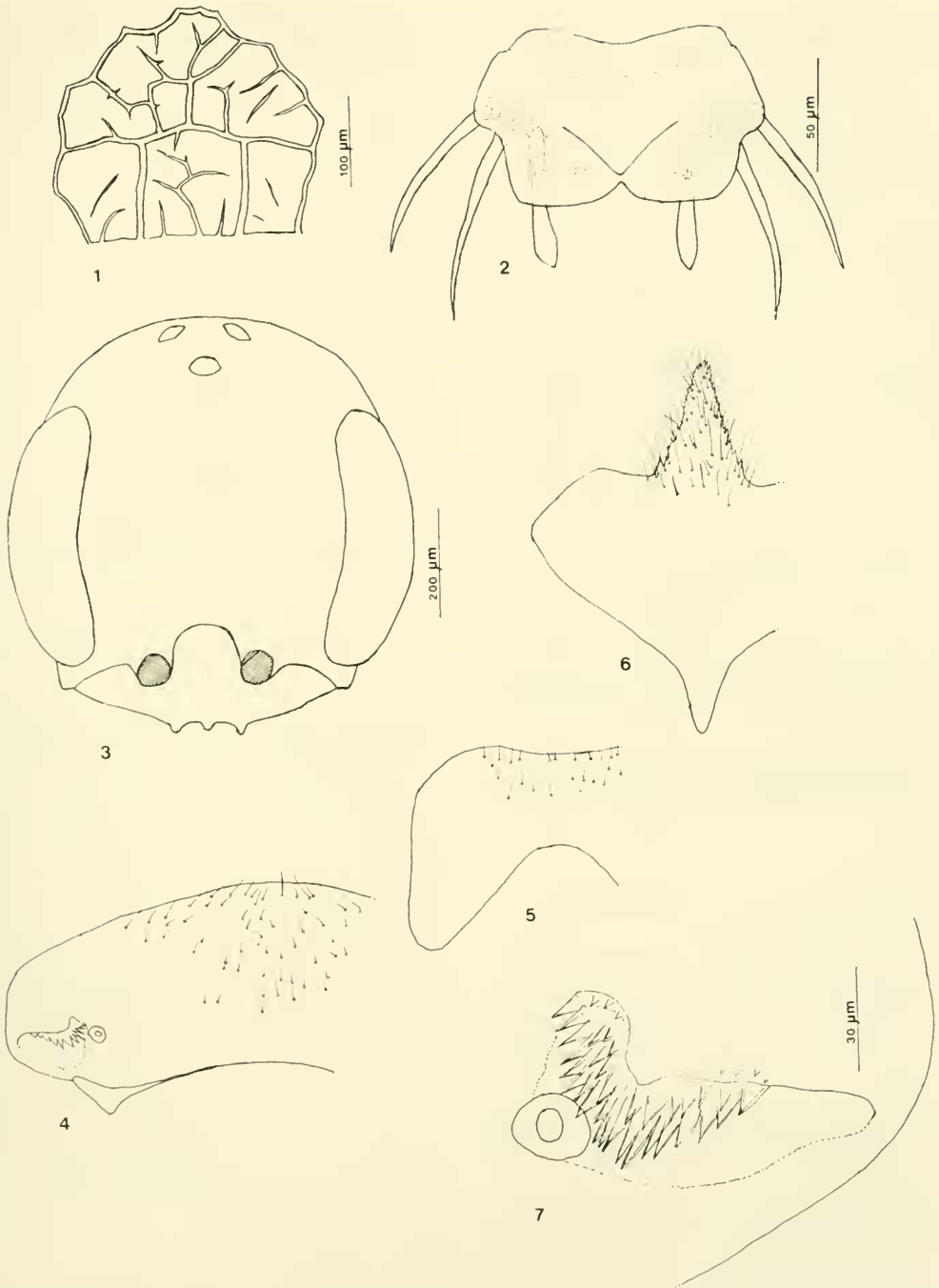
Female.—*Dimensions* (in mm): Body length, 2.7; fore wing length, 2.0; width of mesoscutum (between tegulae), 0.5; maximum width of metasoma, 0.5.

*Colour:* Black. Mandibles rusty brown, with reddish teeth. Antennae testaceous.

Legs, pronotal lobes and tegulae, pale yellow; tarsomeres V, claws and most of posterior coxae and tibiae, brown. Anterior margin of pronotum, sternum I and lateral parts of tergum I, dark brown. Wing membranes hyaline; pterostigma black; veins light brown.

*Vestiture:* Head and thorax with short pale setae, denser on frons, vertex, mesoscutum and mesepisternum. Wings covered with brown setae, darker to the wing apices. Terga I and II with a few sparse very short setae. Terga III–VI covered with short pale setae, sparser on the central portion of tergum III, and longer and yellowish on tergum VI.

*Structure:* Setigerous punctures not conspicuous, more evident on clypeus, vertex near ocelli and scutellum. Disk of clypeus smooth, shining, except for large punctures; at sides, beneath antennal alveoli, with very weak transverse carinae. Scapal basin, just above clypeus, with parallel, fine oblique carinae (finely costulate), and with short longitudinal carina arising from the antennal alveolus (shorter than alveolus diameter). Frons irregularly colliculate, vertex



Figs. 1-7. *M. xylicola*, sp. n., ♀: 1, Pattern of carinae on the dorsal surface of propodeum; 2, Labrum; 3, Head. ♂: 4, Tergum VII; 5, Sternum VII; 6, Sternum VIII; 7, Detail of tegumental denticulation on tergum VII (Figs. 4-6 same scale as Fig. 1).

smoother; gena strigulate. Median carina of frons extended over base of clypeus. Transverse carina of pronotum weak; pronotal collar, just behind transverse carina, with a shallow sulcus. Mesoscutal surface imbricate, posterior two-thirds of disk with weak longitudinal carinae (stronger near scutellum). Scutellum flat, without carinae. Transverse carinae of metanotum stronger at sides and absent at middle. Episternal sulcus narrow, shallow, crossed by numerous parallel longitudinal carinae which extend over whole mesopleuron (costulate pattern). Mesepisternum with oblique carinae converging to median depression posteriorly. Lateral surface of propodeum costulate, interspaces with cross carinae posteriorly. Pattern of carinae on the dorsal surface of propodeum as in Fig. 1. Ventral tooth of mandible about one and a half times as long as dorsal one. Labrum as in Fig. 2. Clypeus roundly convex between the antennae, apex emarginate over central third and with median and two lateral projections (Fig. 3).

Proportions (80 units correspond to 0.98 mm; in parenthesis male allotype proportions):

01. Length and width of marginal cell, 41:18 (40:18)
02. Length and width of pterostigma, 27:13 (25:13)
03. Length (from vertex to clypeal apex) and maximum width of head, 60:57 (57:57)
04. Length and maximum width of compound eye and gena width (lateral view), 42:21:15 (37:23:12)
05. Superior, middle and inferior interorbital distances, 34:36:30 (33:36:33)
06. Length and width of clypeus and clypeo-ocellar distance, 15:35:35 (15:33:35)
07. Malar space and pedicel length, 3:7 (3:7)
08. Inter-alveolar, alveolo-orbital, and al-

veolo-ocellar distances and alveolus diameter, 11:6:41:4 (10:9:41:4)

09. Anterior interocellar, posterior interocellar, and ocello-orbital distances and transversal diameter of anterior ocellus, 5:5:16:4 (5:5:15:4)
10. Length and maximum diameter of scape, 21:5 (21:5)
11. Length of flagellomeres I-III and diameter of third flagellomere, 3:4:4:4 (3:4:4:4)
12. Horizontal segment of transversal carina of pronotum and length of pronotal collar, 28:4 (27:4)
13. Length of mesoscutum and of scutellum, 27:14 (30:15)
14. Width of episternal sulcus (just below pronotal lobe) and distance from episternal sulcus to mesopleural suture (at scrobe), 2:20 (2:20)
15. Length of tibia, basitarsus and distitarsus (tarsomeres II-V) of midleg, 30:20:25 (33:20:25)
16. Length and maximum width of tibia and length of basitarsus and distitarsus of hindleg, 40:8:23:30 (44:9:27:30)

Male.—Dimensions as in female. Similar to female in colour and structure. Tergum VII and sterna VII and VIII as in Figs. 4, 5 and 6, respectively.

Type material.—Holotype ♀, Viçosa-MG, BRASIL 24/11/1990, G. A. R. MELO [Ninho 1: 3 ♀ (1 pre-p.; 1 p. de parasita). Telhado de cisterna]; allotype ♂, Viçosa-MG, BRASIL 24/11/1990, G. A. R. MELO [Ninho 2: 1 ♀ e 1 ♂ (1 p. ♀). Telhado de cisterna], paratypes, 4 ♀♀ and 2 ♂♂, Viçosa-MG, BRASIL 24/11/1990, G. A. R. MELO, Museu de Zoologia da Universidade de São Paulo. Additional paratypes: Viçosa-MG, BRASIL, G. A. R. MELO, 2 ♀♀ and 1 ♂, 26/10/1990, Museu de Entomologia da Universidade Federal de Viçosa; 2 ♀♀, 27/10/1990, Museu Nacional, Rio de Janeiro; 2 ♀♀ and 1 ♂, 27/10/1990, Museu Pe. J. S. Moure, Universidade Federal do Paraná, Curitiba; ♀, 15/11/1990, Museu Paraense Emílio

Goeldi, Belém; ♀, 21/10/1990 and ♀, 24/10/1990, U.S. National Museum of Natural History, Washington.

Discussion.—*M. xylicola*, sp. n. and *M. similis*, sp. n. constitute a distinct group within *Microstigmus* and can be distinguished from other known species by their elongated head, the strong lateral projections of the clypeus apex, the strong microsculpture of frons and gena, the black prothorax, and by their nesting habits. An analysis of the phylogenetic relationships among *Microstigmus* species will appear in another paper (Melo, in prep.). *M. xylicola* sp. n. has the median carina of frons strong and extended over the base of the clypeus, the frons irregularly colliculate (reticulation more elongated and rectangular, notably near the vertex), and the whole gena strigulate.

***Microstigmus similis* Melo,  
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Female.—Dimensions as in *M. xylicola*, sp. n. Very close to *M. xylicola*, sp. n., but differs as follows: wing veins brown; short setae on central portion of tergum III more sparse; frons (including scapal basin) and vertex uniformly colliculate; gena, above oral cavity, weakly colliculate, shining; median carina of frons not extended over base of clypeus; episternal sulcus crossed by short carinae; mesopleuron weakly colliculate (not costullate), with longitudinal carinae only at hypersternaulus; carinae on lateral surface of propodeum stronger, interspaces without cross carinae; median projection on clypeal apex less pronounced.

Proportions (80 units correspond to 0.98 mm):

01. Length and width of marginal cell, 45:18
02. Length and width of pterostigma, 28:14
03. Length (from vertex to clypeal apex) and maximum width of head, 63:58

04. Length and maximum width of compound eye and gena width (lateral view), 43:19:16
05. Superior, middle and inferior interorbital distances, 34:38:33
06. Length and width of clypeus and clypeo-ocellar distance, 15:38:38
07. Malar space and pedicel length, 4:6
08. Interaveolar, alveolo-orbital, and alveolo-ocellar distances and alveolus diameter, 12:8:40:5
09. Anterior interocellar, posterior interocellar, and ocello-orbital distances and transversal diameter of anterior ocellus, 5:5:14:5
10. Length and maximum diameter of scape, 20:5
11. Length of flagellomeres I–III and diameter of third flagellomere, 4:4:4:4
12. Horizontal segment of transversal carina of pronotum and length of pronotal collar, 27:4
13. Length of mesoscutum and of scutellum, 30:15
14. Width of episternal sulcus (just below pronotal lobe) and distance from episternal sulcus to mesopleural suture (at scrobe), 3:21
15. Length of tibia, basitarsus and distitarsus (tarsomeres II–V) of midleg, 31:20:26
16. Length and maximum width of tibia and length of basitarsus and distitarsus of hindleg, 43:9:25:32

Male unknown.

Type material.—Holotype ♀, Viçosa-MG, BRASIL 29/11/1991, G. MELO & M. COSTA [Ninho em orifício em esteio. Mata do Paraíso (Casa do Sr. R. Stanciola)]; paratypes, 2 ♀♀ (data as in holotype), Museu de Zoologia da Universidade de São Paulo, São Paulo.

Discussion.—*M. similis*, sp. n. can be easily distinguished from *M. xylicola*, sp. n. by having the frons regularly colliculate (rounded reticulation), and by having the gena (above oral cavity) and mesopleuron



weakly colliculate. Also, the median carina of the frons does not extend over the base of the clypeus, as it does in *xylicola*.

The nests of these species are constructed in abandoned beetle galleries within beams of exposed roofs. The wasps excavate the beetle frass and cover the nest walls with silk. These species do not build a turret at the nest entrance as do some *Spilomena* species. Generally, the brood cells are constructed in linear series (2 to 3 cells) placed at the end of the burrows. Most open nests were ramified internally. The cells are mass provisioned with Thysanoptera nymphs. Contrary to most other *Microstigmus* species (Melo, in prep.), in these species, the larvae have spinnerets and spin a cocoon. After cocoon spinning, the pre-defecating larvae orient with their heads directed to the nest entrance and defecate at the opposite end. Some nests contained more than one female. Males were also present in some nests and, as in other *Microstigmus*, they appear to reside in the nests.

***Goniozus microstigma* Evans,**

**NEW SPECIES**

Type.—♀, BRASIL: Viçosa, Minas Gerais, 30 Nov. 1990, G. A. R. de Melo [Entrando em ninhos de *Microstigmus* (orifício em caibro). Cisterna (UFV)]. Museu de Zoologia da Universidade de São Paulo, São Paulo.

Description of the female type.—Length 2.3 mm; fore wing 1.8 mm. Black, except mandibles dull rufous apically, antennae light brown, darkened on upper surface and apically; legs dark brown except tibiae and tarsi light yellow-brown; wings hyaline, costa, prostigma, and stigma dark brown, other veins light brown. Mandibles nearly straight, terminating in four small teeth apically; clypeus angulate apically, surface convex, with a polished median carina which continues up the frons to just above level of antennal scrobes, this carina arched in profile; scrobes well defined but not carinate. Width of head 0.88 times length of head;

width of frons 0.91 times height of eye; sides of head roundly convergent behind eyes to a straight, sharp vertex crest. Front angle of ocellar triangle about a right angle; ocellular distance subequal to width of ocellar triangle; posterior ocelli separated from vertex crest by about a quarter of their own diameters. Antennae short, barely able to reach crest of vertex; first four segments in a ratio of about 6:3:2:2, segment three and those following slightly wider than long. Frons alutaceous, moderately shining, with small, setigerous punctures separated by 3 to 8 times their own diameters.

Thoracic dorsum alutaceous, moderately shining and with sparse, small punctures much like frons. Propodeum polished along a broad median band, alutaceous dorsolaterally. Front femur robust, twice as long as its maximum width. Gaster slightly depressed, strongly shining. Fore wing with a closed areolet.

Paratypes.—6 ♀♀, data as in type, except 24.xi.1990 [Nascido de pupa coletada em ninho de *Microstigmus*], 15.iii.1991 [*Microstigmus* de madeira. Cisterna (UFV)], 26.xi.1991 [Caminhando sobre esteio da cabana. Mata do Paraíso], 29.xi.1991 [Caminhando sobre esteio. Mata do Paraíso (Casa do Sr. R. Stanciola)]. 4 ♀♀, Museu de Zoologia da Universidade de São Paulo, São Paulo; 2 ♀♀, U.S. National Museum of Natural History, Washington.

Variation.—The paratypes vary in fore wing length from 1.3 to 1.8 mm. In three paratypes the tibiae are nearly as dark as the femora, and in these specimens the antennae are somewhat darker than in the type. Width of head varies from 0.86 to 0.91 times the length of head. The front femur varies from 1.9 to 2.0 times as long as its maximum width. Otherwise these specimens resemble the type closely.

Remarks.—This species is a member of the *punctaticeps* species-group, as defined by Evans (1978, p. 236). It differs from the seven known species of that group in having the clypeus merely convex medially, rather

than in the form of a sharp median keel; also the frons is narrower as compared to the eye height than in any of those species. The short antennae suggest *emigratus* (Rohwer), but that species has more robust front femora and a broader frons.

Most species of *Goniozus* attack Microlepidoptera larvae occurring in concealed situations, including plant stems (Evans 1978, p. 274). However, there are isolated records of attacks on beetle larvae. There are no records of attacks on larvae of Hymenoptera, but an association with *Microstigmus* larvae occurring in wood seems not unreasonable. Adults of *G. microstigma*, sp. n. were collected entering a nest or walking near nests of *M. xylicola*, sp. n. and *M. similis*, sp. n. One white pupa of the parasitoid was found within a brood cell of *M. xylicola*, sp. n.

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